

Claims

What is claimed is:

1 1. A processor-implemented method for providing a desired level of performance for a
2 wireless network, the method comprising the steps of:

3 applying an optimization process to a set of information characterizing the network,
4 the optimization process comprising a multi-stage process including at least a frequency assignment
5 stage and a post-frequency-assignment optimization stage, the post-frequency-assignment
6 optimization stage being applied after assignment of frequencies to one or more communication
7 channels of the wireless network in the frequency assignment stage, and wherein at least a subset of
8 the stages of the multi-stage process are iterated; and

9 utilizing an output of the optimization process to determine at least one operating
10 parameter of the wireless network.

1 2. The method of claim 1 wherein the optimization process further comprises a three-stage
2 optimization process having a pre-frequency-assignment optimization stage, the frequency
3 assignment stage and the post-frequency-assignment optimization stage.

1 3. The method of claim 1 wherein at least a subset of the three stages of the three-stage
2 optimization process are repeated in an iterative manner.

1 4. The method of claim 1 wherein the frequency assignment stage comprises a frequency
2 planning stage.

1 5. The method of claim 1 wherein the wireless network implements a frequency reuse factor
2 greater than one.

1 6. The method of claim 1 wherein the wireless network comprises at least one of a TDMA
2 wireless network, an FDMA wireless network, a CDMA wireless network, an OFDM wireless
3 network, and a TDD wireless network.

1 7. The method of claim 1 wherein the optimization process utilizes a derivative-based
2 optimization of a specified objective function.

1 8. The method of claim 1 wherein the operating parameter of the wireless network
2 comprises at least one of a base station transmit power and an antenna orientation.

1 9. The method of claim 1 wherein the optimization process determines a network
2 configuration for specified values of network capacity and network coverage.

1 10. The method of claim 1 wherein the optimization process generates a graphical display
2 in the form of a tradeoff curve of capacity versus coverage.

1 11. The method of claim 1 wherein the optimization process generates a graphical display
2 in the form of a tradeoff curve of percent carrier-to-interference ratio above threshold versus
3 coverage.

1 12. An apparatus for use in providing a desired level of performance for a wireless network,
2 the apparatus comprising:

3 a processor-based system operative to apply an optimization process to a set of
4 information characterizing the network, the optimization process comprising a multi-stage process
5 including at least a frequency assignment stage and a post-frequency-assignment optimization stage,
6 the post-frequency-assignment optimization stage being applied after assignment of frequencies to
7 one or more communication channels of the wireless network in the frequency assignment stage, and
8 wherein at least a subset of the stages of the multi-stage process are iterated;

9 wherein an output of the optimization process is utilized to determine at least one
10 operating parameter of the wireless network.

1 13. An apparatus for use in providing a desired level of performance for a wireless network,
2 the apparatus comprising:

3 means for applying an optimization process to a set of information characterizing the
4 network, the optimization process comprising a multi-stage process including at least a frequency
5 assignment stage and a post-frequency-assignment optimization stage, the post-frequency-
6 assignment optimization stage being applied after assignment of frequencies to one or more
7 communication channels of the wireless network in the frequency assignment stage, and wherein at
8 least a subset of the stages of the multi-stage process are iterated; and

9 means for utilizing an output of the optimization process to determine at least one
10 operating parameter of the wireless network.

1 14. An article of manufacture comprising a machine-readable medium for storing one or
2 more software programs for use in providing a desired level of performance for a wireless network,
3 wherein the one or more programs when executed by a processor-based system perform the step of:

4 applying an optimization process to a set of information characterizing the network,
5 the optimization process comprising a multi-stage process including at least a frequency assignment
6 stage and a post-frequency-assignment optimization stage, the post-frequency-assignment
7 optimization stage being applied after assignment of frequencies to one or more communication
8 channels of the wireless network in the frequency assignment stage, and wherein at least a subset of
9 the stages of the multi-stage process are iterated;

10 wherein an output of the optimization process is utilized to determine at least one
11 operating parameter of the wireless network.